

REMARKS

In paragraph 1 of the Office Action it is indicated that the drawings filed on November 13, 2003 have been received and approved. Applicant appreciates the approval of the drawings.

In paragraphs 2 and 3 of the Office Action claims 7 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention, stating:

“Claim 7 recites the limitation “the bias spacer reduction layer” in line 1. There is insufficient antecedent basis for this limitation in the claims.

Regarding claim 18: See rejection above for claim 7.”

Responsive thereto, Applicant has amended claims 7 and 18 to delete the word “spacer”. Applicant respectfully submits that this ground of indefiniteness has been cured by this amendment.

In paragraphs 4 and 5 of the Office Action claims 1, 10-12 and 21-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Takano (US PAP No. 2004/02524 19 A1), stating:

“As recited in claim 1, Takano shows a magnetic head (see Fig. 2b) comprising: a free magnetic layer 13 having two ends, two hard bias layers (1 la and 1 lb), each adjoining a corresponding end of the free magnetic layer 13, and which create a bias magnetic field within the free magnetic layer (see arrow in Fig. 2b); a bias reduction layer 121 disposed parallel to the free magnetic layer; and a bias spacer layer 25 disposed parallel to and between the free magnetic layer and the bias reduction layer; wherein the bias reduction layer creates a magnetic field within the free magnetic layer (“cancellation of the field induced in the free layer by the main bias layers is achieved. This field cancellation is due to the presence of a return flux associated with the compensatory bias layer”, see ¶ 0016) that is directed oppositely to the bias magnetic field (see other arrow in Fig. 2b).

As recited in claim 10, Takano shows that a bias reduction material and a bias reduction layer thickness are selected (“magnetic properties of thin films are known to be very sensitive to a number of factors in addition to their composition. Said factors include, but may not be limited to, thickness”, see ¶ 0043, emphasis added) so as to produce a bias reduction magnetic field within the free magnetic layer, wherein the bias reduction magnetic field counteracts the bias magnetic field at positions within the free magnetic layer that are between ends of the free magnetic layer (see Fig. 2b). Furthermore, the product by process limitations in these claims (e.g. “selected”) are directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See also In re

Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessman, 180 USPQ 324; In re Avery, 186 USPQ 161; In re Wertheim, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); In re Marosi et al, 218 USPQ 289; and particularly In re Thorpe, 227 USPQ 964, all of which make it clear that it is the patentability of the final structure of the product “gleaned” from the process limitations or steps, which must be determined in a “product by process” claim, and not the patentability of the process limitations. Moreover, an old or obvious product produced by a new method is not a patentable product, whether claimed in “product by process” claims or not. Note that the applicant has the burden of proof in such cases, as the above case law makes clear.

As recited in claim 11, Takano shows that the hard bias layers (11 a and 11 b) induce an edge bias magnetic field within the free magnetic layer at the ends of the free magnetic layer (see arrows in Fig. 2b), where the edge bias magnetic field is of sufficient strength to stabilize the free magnetic layer even when partially counteracted by a bias reduction magnetic field created by coupling of the free magnetic layer with the bias reduction layer 121 (“output is both stable as well as unaffected by the steps taken to achieve stability”, see ¶ 0013).

As recited in claim 12, in addition to the above teachings, Takano shows a hard disk drive (“magnetic disk storage”, see ¶ 0001) inherently comprising a disk having a surface that includes the magnetic medium; a motor coupled to rotate the disk; a slider having an air bearing surface; an actuator configured to hold the air bearing surface of the slider proximate to the surface of the disk; and a magnetic head disposed within the slider and forming part of the air bearing surface.

Regarding claim 21: See above for claim 10.

Regarding claim 22: See above for claim 11.”

Responsive hereto, Applicant has amended independent claims 1 and 12 to include limitations previously set forth in dependent claims 2 and 13 respectively. Applicant notes that dependent claims 2 and 13 are indicated to include allowable subject matter in paragraph 6 of the Office Action, and by this amendment independent claims 1 and 12 have been rendered allowable.

With regard to dependent claims 10, 11 and 21, 22, applicant respectfully submits that these dependent claims are allowable in that they depend from allowable amended independent claims 1 and 12 respectively.

In paragraphs 6 and 7 of the Office Action allowable subject matter is indicated, stating:

“Claims 2-6, 8-9, 13-17 and 19-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 7 and 18 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The Examiner notes the teaching in Takano that “the parameters that characterize the layers named in the claims to be recited below should be regarded as critical rather than merely optimal” (see ¶ 0043). Because the layers in Takano are critical, the prior art of record neither shows nor suggests altering the Takano structure to arrive at the claimed structure.”

Applicant appreciates the indication of allowable subject matter. As indicated above, Applicant has amended independent claims 1 and 12 to include limitations previously set forth in dependent claims 2 and 13, respectively. In that all of the dependent claims identified in this paragraph are dependent from allowable amended independent claims 1 and 12 directly or indirectly, Applicant respectfully submits that these dependent claims are now also allowable in that they depend from an allowable base claim.

In paragraph 9 of the Office Action the prior art made of record and not relied upon is considered pertinent to applicant’s disclosure, stating:

“Shimizu et al (US PAP No. 2003/0090844 A1) show a magnetoresistive device comprising free layers 122 and 126, “with such a layer thickness of a non-magnetic metal layer that directions of magnetization in the ferromagnetic layers are parallel to each other, whereby the free layer of a laminated structure preferably behaves as one body in the magnetic field from the carrier” (see ¶ 0048), and further disclose a known synthetic fern structure with oppositely magnetized free layers antiferromagnetically coupled by “thickness of the Ru layer of 5-9 Å” wherein “no examples have been proposed to use the synthetic fern structure that arranges directions of magnetization between the Co layers to be parallel to each other” (see ¶ 0047).

Alps (IP 2004-6493) shows a huge MR device for a hard drive (see especially Figs. 1 and 12).”

Applicant has reviewed the cited prior art and believes that the claims, as amended, are patentable over the teachings thereof.

Having responded to all of the paragraphs of the Office Action, and having amended the claims accordingly, Applicant respectfully submits that the Application is now in condition for allowance. Applicant therefore respectfully requests that a Notice of Allowance be forthcoming

at the Examiner's earliest opportunity. Should the Examiner have any questions or comments with regard to this amendment, a telephonic conference at the number set forth below is respectfully requested.

Respectfully submitted,



ROBERT O. GUILLOT

Reg. No. 28,852

Dated: May 16, 2005


IPLO®

Intellectual Property Law Offices
1901 S. Bascom Avenue, Suite 660
Campbell, CA 95008
Telephone: (408) 558-9950
Facsimile: (408) 558-9960

CERTIFICATE OF MAILING (37 CFR 1.8(a))

I hereby certify that this paper (along with any referred to as being attached or enclosed) is being deposited on May 16, 2005 with the U.S. Postal Service as first class mail in an envelope addressed to: MS Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Date: May 16, 2005


Patricia Beilmann